Figure 1, HCV J4L6 genome wild-type cDNA sequence, reference accession number
AF054247,

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Figure 2, codon optimised HCV Core polynucleotide

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CCCGGCTGGGCGTGCGCGCCACCCGCAAGACCAGCGAGCGCTCCCAGCCAAGAGGCAGACGC

CAGCCGATCCCGAAGGCCCGCCGCCCTGAGGGCCGGGCTTGGGCCCAGCCAGGCTACCCCTG

GCCCCTGTATGGCAACGAGGGCCTGGGATGGGCTGGGTGGCTCCTCAGCCCCCGGGGGTCTA

GGCCCAGTTGGGGACCGACCGACCCCCGCAGGCGCAGCCGCAACCTGGGAAAGGTGATCGAC

ACGCTCACCTGCGGCTTCGCCGACTTGATGGGATACATCCCTCTGGTGGGGGCCCCTCTGGG

CGGAGCCGCGCGCGCCCTGGCTCACGGGGTCCGGGTGCTCGAGGACGGGGTGAACTACGCCA

CCGGGAACCTGCCCGGCTGCAGCTTCTCCATCTTCCTGCTGGCGCTGCTGAGCTGCCTCACC

ATCCCCGCTAGCGCATGA

Figure 3, Codon optimised HCV NS3 polynucleotide

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TCTGACAGGCCGGGATAAGAACCAGGTGGAGGGCGAGGTGCAGGTCGTCTCGACCGCTACCC

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TGTACCGCCTGGGCGCGGTGCAGAACGAAGTCACCTTGACCCACCCCATCACCAAGTACATC

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Figure 4, codon optimised HCV NS4B polynucleotide

ATGTTTTGGGCCAAGCATATGTGGAACTTCATCAGCGGCATCCAGTACCTCGCCGGGCTGAG

CACCCTCCCGGGCAACCCCGCGATCGCAAGCCTGATGGCGTTCACAGCGAGCATCACCTCCC

CCCTGACTACCCAGAACACACTGCTGTTCAACATCCTGGGGGGCTGGGTCGCCGCTCAGCTG

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ACCCAGATCCTGAGCTCCCTGACCATCACCCAGCTGCTCAAGAGGCTGCACCAGTGGATCAA

CGAGGACTGCTCCACCCCTTGCTGA

Figure 5, codon optimised HCV NS5B polynucleotide

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CGAGCCTCTCGACCTGCCCCAGATCATCGAGAGACTGCATGGGCTCAGCGCCTTCTCCCTCC
ATAGTTACTCTCCTGGAGAAATTAACCGGGTGGCGAGCTGTCTGCGGAAGCTCGGCGTCCCC
CCTCTGCGCGTTTGGCGGCATCGCGCCAGGAGTGTGAGGGCCAAGCTGCTGAGCCAGGGCGG
AAGGGCCGCCACCTGCGGCCGGTATCTCTTCAACTGGGCCGTGCGCACCAAGCTCAAGCTCA
CCCCCATCCCTGCCGCCAGTCAGCTGGATCTCAGTGGGTGGTTCGTGGCCGGCTATTCTGGC
GGCGACATCTACCACTCCCTCAGCAGGGCGCGCCCCGCTGGTTCCCCCTGTGCCTGCTGCT
CCTGAGCGTCGGAGTCGGCATCTACCTGCTGCCCAACCGCTGA

Figure 6,   *Translation of HCV J4L6 genome (wild-type sequence)*

```
   1 MSTNPKPQRK TKRNTNRRPQ DVKFPGGGQI VGGVYLLPRR GPRLGVRATR KASERSQPRG
  61 RRQPIPKARR PEGRAWAQPG YPWPLYGNEG LGWAGWLLSP RGSRPSWGPT DPRRRSRNLG
 121 KVIDTLTCGF ADLMGYIPLV GAPLGGAARA LAHGVRVLED GVNYATGNLP GCSFSIFLLA
 181 LLSCLTIPAS AYEVRNVSGI YHVTNDCSNS SIVYEAADVI MHTPGCVPCV QEGNSSRCWV
 241 ALTPTLAARN ASVPTTTIRR HVDLLVGTAA FCSAMYVGDL CGSIFLVSQL FTFSPRRHET
 301 VQDCNCSIYP GHVSGHRMAW DMMMNWSPTT ALVVSQLLRI PQAVVDMVAG AHWGVLAGLA
 361 YYSMVGNWAK VLIVALLFAG VDGETHTTGR VAGHTTSGFT SLFSSGASQK IQLVNTNGSW
 421 HINRTALNCN DSLQTGFFAA LFYAHKFNSS GCPERMASCR PIDWFAQGWG PITYTKPNSS
 481 DQRPYCWHYA PRPCGVVPAS QVCGPVYCFT PSPVVVGTTD RSGVPTYSWG ENETDVMLLN
 541 NTRPPQGNWF GCTWMNSTGF TKTCGGPPCN IGGVGNRTLI CPTDCFRKHP EATYTKCGSG
 601 PWLTPRCLVD YPYRLWHYPC TLNFSIFKVR MYVGGVEHRL NAACNWTRGE RCNLEDRDRS
 661 ELSPLLLSTT EWQILPCAFT TLPALSTGLI HLHQNIVDVQ YLYGVGSAFV SFAIKWEYIL
 721 LLFLLLADAR VCACLWMMLL IAQAEAALEN LVVLNAASVA GAHGILSFLV FFCAAWYIKG
 781 RLAPGAAYAF YGVWPLLLLL LALPPRAYAL DREMAASCGG AVLVGLVFLT LSPYYKVFLT
 841 RLIWWLQYFI TRAEAHMQVW VPPLNVRGGR DAIILLTCAV HPELIFDITK LLLAILGPLM
 901 VLQAGITRVP YFVRAQGLIR ACMLVRKVAG GHYVQMVFMK LGALTGTYVY NHLTPLRDWA
 961 HAGLRDLAVA VEPVVFSAME TKVITWGADT AACGDIILGL PVSARRGKEI FLGPADSLEG
1021 QGWRLLAPIT AYSQQTRGVL GCIITSLTGR DKNQVEGEVQ VVSTATQSFL ATCINGVCWT
1081 VYHGAGSKTL AGPKGPITQM YTNVDLDLVG WQAPPGARSM TPCSCGSSDL YLVTRHADVI
1141 PVRRRGDSRG SLLSPRPVSY LKGSSGGPLL CPSGHVVGVF RAAVCTRGVA KAVDFIPVES
1201 METTMRSPVF TDNSTPPAVP QTFQVAHLHA PTGSGKSTKV PAAYAAQGYK VLVLNPSVAA
1261 TLGFGAYMSK AHGIDPNIRT GVRTITTGGS ITYSTYGKFL ADGGCSGGAY DIIICDECHS
1321 TDSTTILGIG TVLDQAETAG ARLVVLATAT PPGSVTVPHP NIEEIGLSNN GEIPFYGKAI
1381 PIEAIKGGRH LIFCHSKKKC DELAAKLTGL GLNAVAYYRG LDVSVIPPIG DVVVVATDAL
1441 MTGFTGDFDS VIDCNTCVTQ TVDFSLDPTF TIETTTVPQD AVSRSQRRGR TGRGRSGIYR
1501 FVTPGERPSG MFDSSVLCEC YDAGCAWYEL TPAETSVRLR AYLNTPGLPV CQDHLEFWES
1561 VFTGLTHIDA HFLSQTKQAG DNFPYLVAYQ ATVCARAQAP PPSWDQMWKC LIRLKPTLHG
1621 PTPLLYRLGA VQNEVILTHP ITKYIMACMS ADLEVVTSTW VLVGGVLAAL AAYCLTTGSV
1681 VIVGRIILSG KPAVVPDREV LYQEFDEMEE CASQLPYIEQ GMQLAEQFKQ KALGLLQTAT
1741 KQAEAAAPVV ESKWRALETF WAKHMWNFIS GIQYLAGLST LPGNPAIASL MAFTASITSP
1801 LTTQNTLLFN ILGGWVAAQL APPSAASAFV GAGIAGAAVG SIGLGKVLVD ILAGYGAGVA
1861 GALVAFKVMS GEVPSTEDLV NLLPAILSPG ALVVGVVCAA ILRRHVGPGE GAVQWMNRLI
1921 AFASRGNHVS PTHYVPESDA AARVTQILSS LTITQLLKRL HQWINEDCST PCSGSWLRDV
1981 WDWICTVLTD FKTWLQSKLL PRLPGVPFLS CQRGYKGVWR GDGIMQTTCP CGAQIAGHVK
2041 NGSMRIVGPR TCSNTWHGTF PINAYTTGPC TPSPAPNYSR ALWRVAAEEY VEVTRVGDFH
2101 YVTGMTTDNV KCPCQVPAPE FFTEVDGVRL HRYAPACKPL LREDVTFQVG LNQYLVGSQL
```

```
2161  PCEPEPDVTV  LTSMLTDPSH  ITAETAKRRL  ARGSPPSLAS  SSASQLSAPS  LKATCTTHHD
2221  SPDADLIEAN  LLWRQEMGGN  ITRVESENKV  VILDSFEPLH  AEGDEREISV  AAEILRKSRK
2281  FPSALPIWAR  PDYNPPLLES  WKDPDYVPPV  VHGCPLPPTK  APPIPPPRRK  RTVVLTESNV
2341  SSALAELATK  TFGSSGSSAV  DSGTATALPD  LASDDGDKGS  DVESYSSMPP  LEGEPGDPDL
2401  SDGSWSTVSE  EASEDVVCCS  MSYTWTGALI  TPCAAEESKL  PINPLSNSLL  RHHNMVYATT
2461  SRSASLRQKK  VTFDRLQVLD  DHYRDVLKEM  KAKASTVKAK  LLSIEEACKL  TPPHSAKSKF
2521  GYGAKDVRNL  SSRAVNHIRS  VWEDLLEDTE  TPIDTTIMAK  SEVFCVQPEK  GGRKPARLIV
2581  FPDLGVRVCE  KMALYDVVST  LPQAVMGSSY  GFQYSPKQRV  EFLVNTWKSK  KCPMGFSYDT
2641  RCFDSTVTES  DIRVEESIYQ  CCDLAPEARQ  AIRSLTERLY  IGGPLTNSKG  QNCGYRRCRA
2701  SGVLTTSCGN  TLTCYLKATA  ACRAAKLQDC  TMLVNGDDLV  VICESAGTQE  DAAALRAFTE
2761  AMTRYSAPPG  DPPQPEYDLE  LITSCSSNVS  VAHDASGKRV  YYLTRDPTTP  LARAAWETAR
2821  HTPINSWLGN  IIMYAPTLWA  RMILMTHFFS  ILLAQEQLEK  ALDCQIYGAC  YSIEPLDLPQ
2881  IIERLHGLSA  FTLHSYSPGE  INRVASCLRK  LGVPPLRTWR  HRARSVRAKL  LSQGGRAATC
2941  GRYLFNWAVR  TKLKLTPIPA  ASQLDLSGWF  VAGYSGGDIY  HSLSRARPRW  FPLCLLLLSV
3001  GVGIYLLPNR
```

Figure 7, p7313-ie
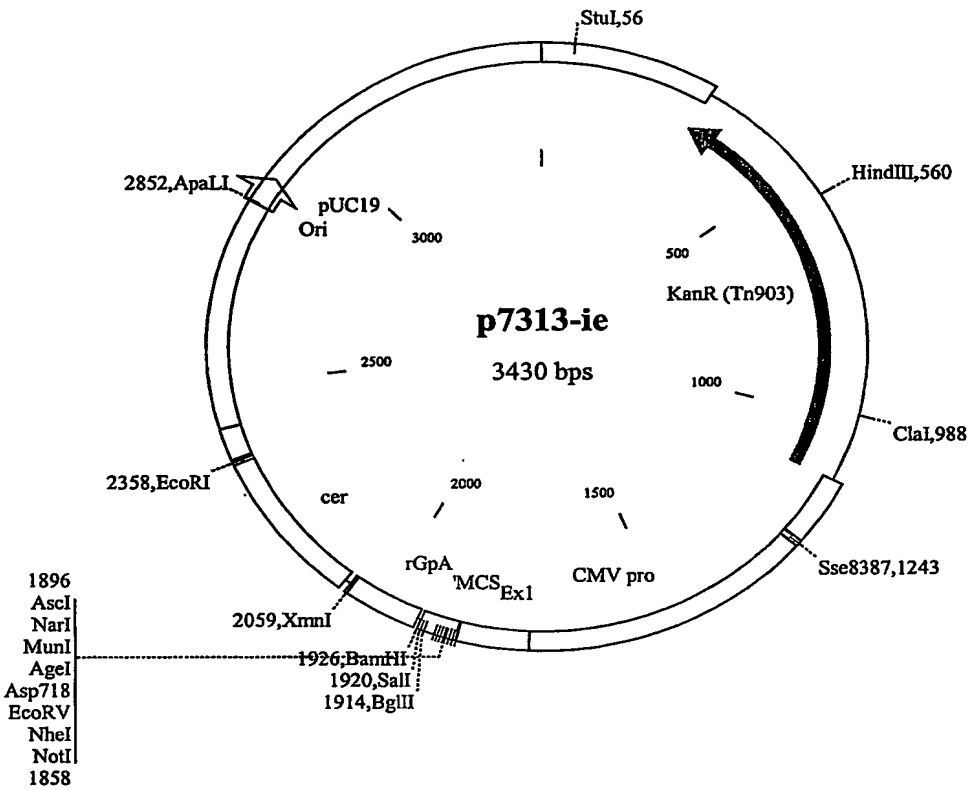
Figure 8, Immune responses to Core
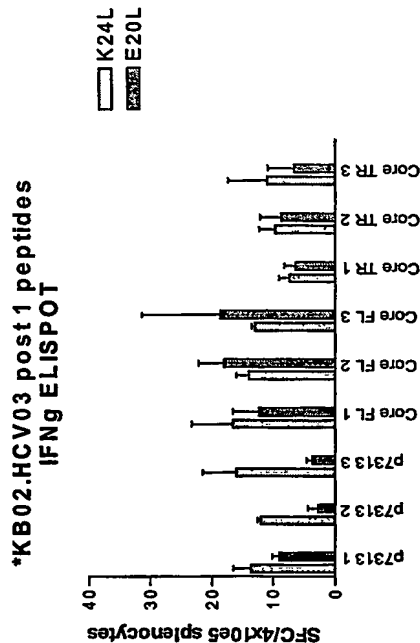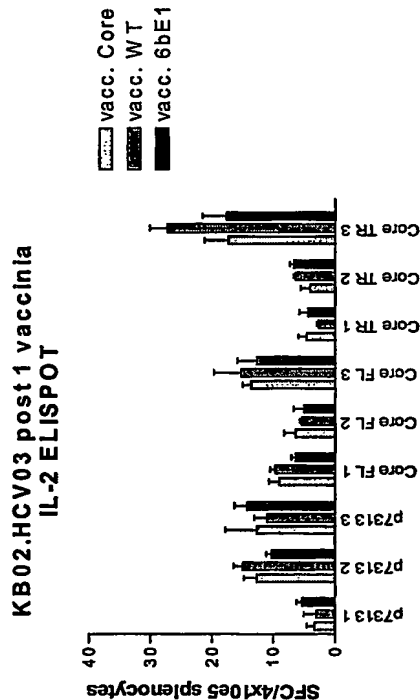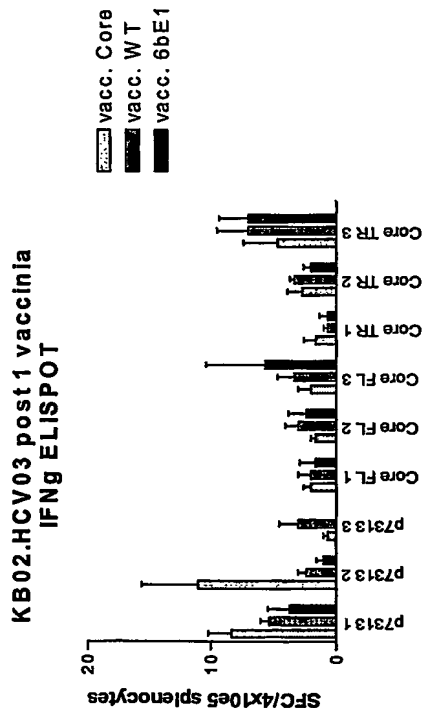
Figure 9, NS3 immunogenicity
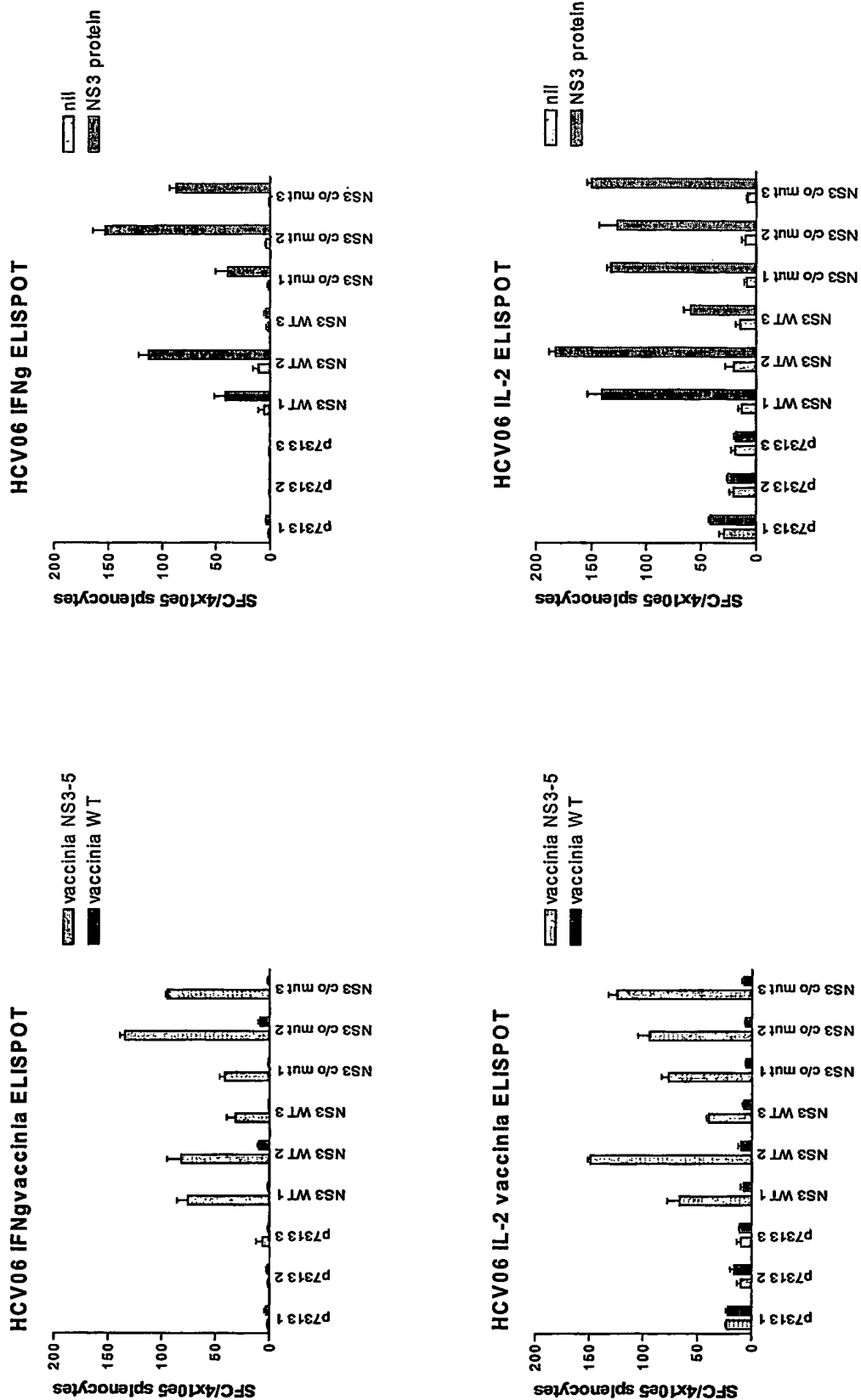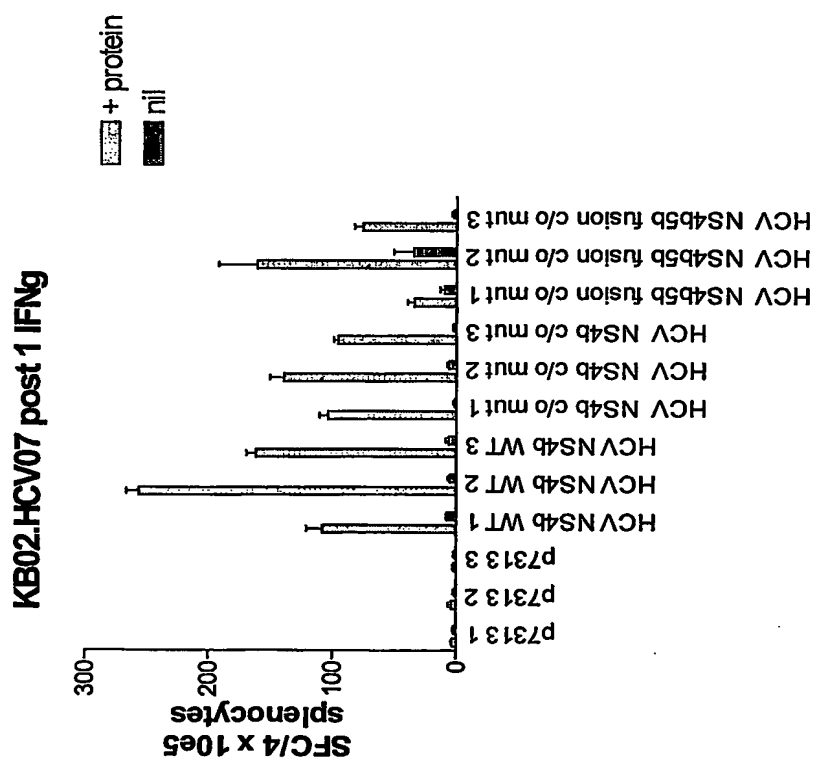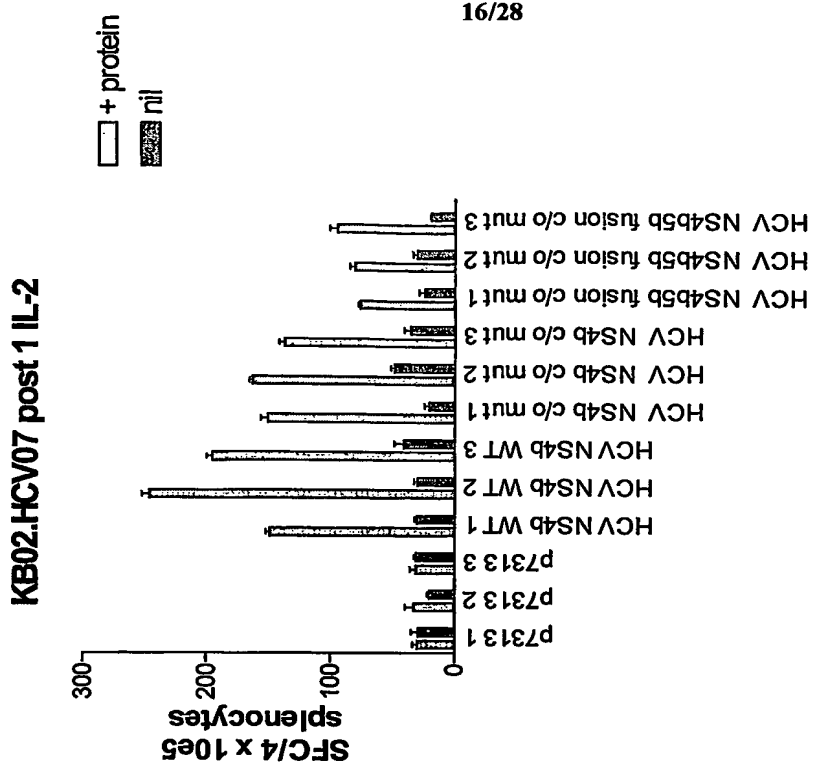
Figure 10, Immune responses to NS4B

KB02.HCV07 post 1 IL-2

☐ + protein
▨ nil

KB02.HCV07 post 1 IFNg

▨ + protein
■ nil

Figure 11, NS5B immune responses
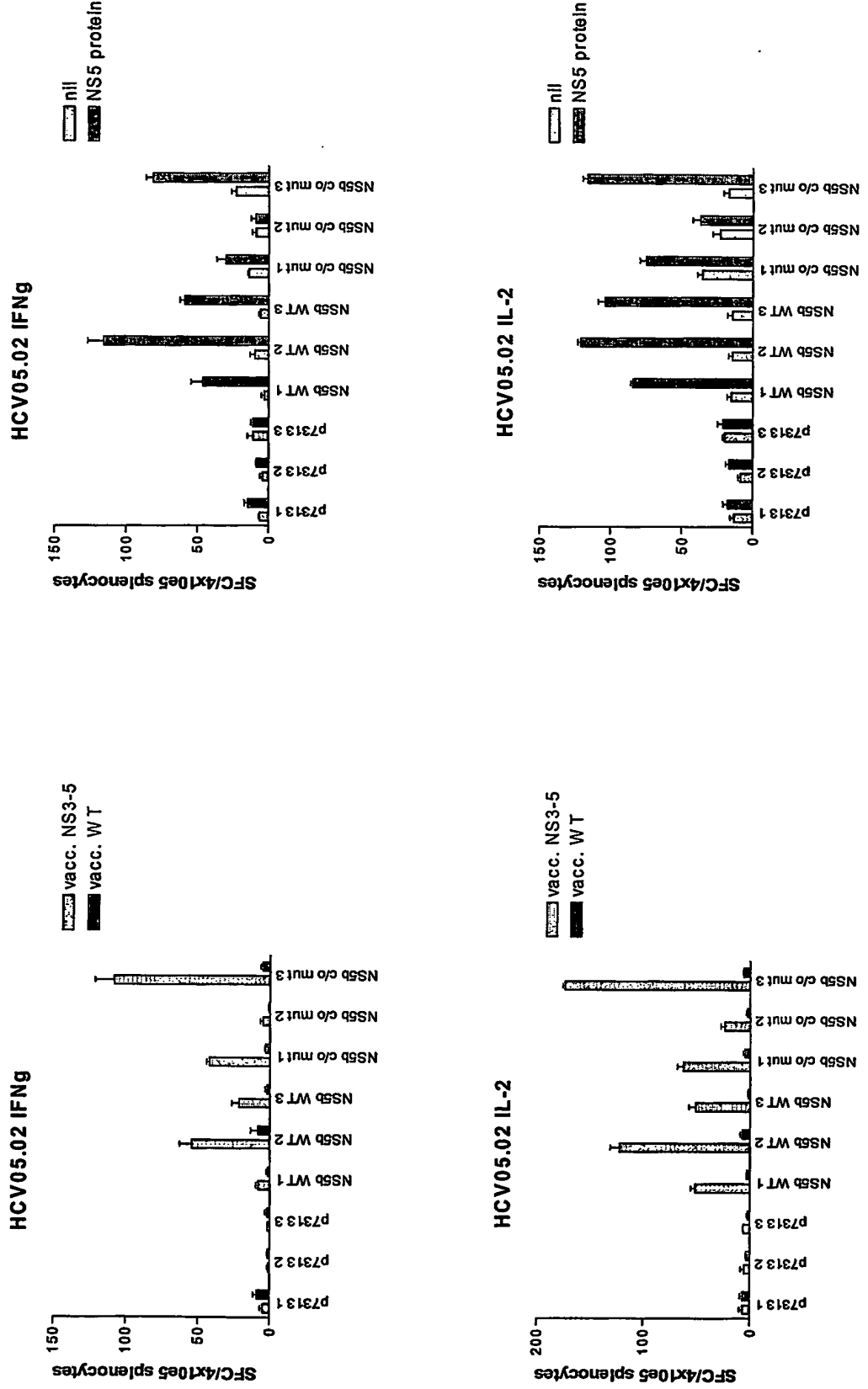
FIG. 12

Anti-HCV NS5B

FIG. 13, A

NS3 protein ELISPOT IL-2

B.

NS3 protein ELISPOT (IFNg)

FIG 14.

Vaccinia ELISPOT IFNg

Vaccinia ELISPOT IL-2

FIG. 15,

0.01 ug coding DNA

FIG. 16,

10/534774
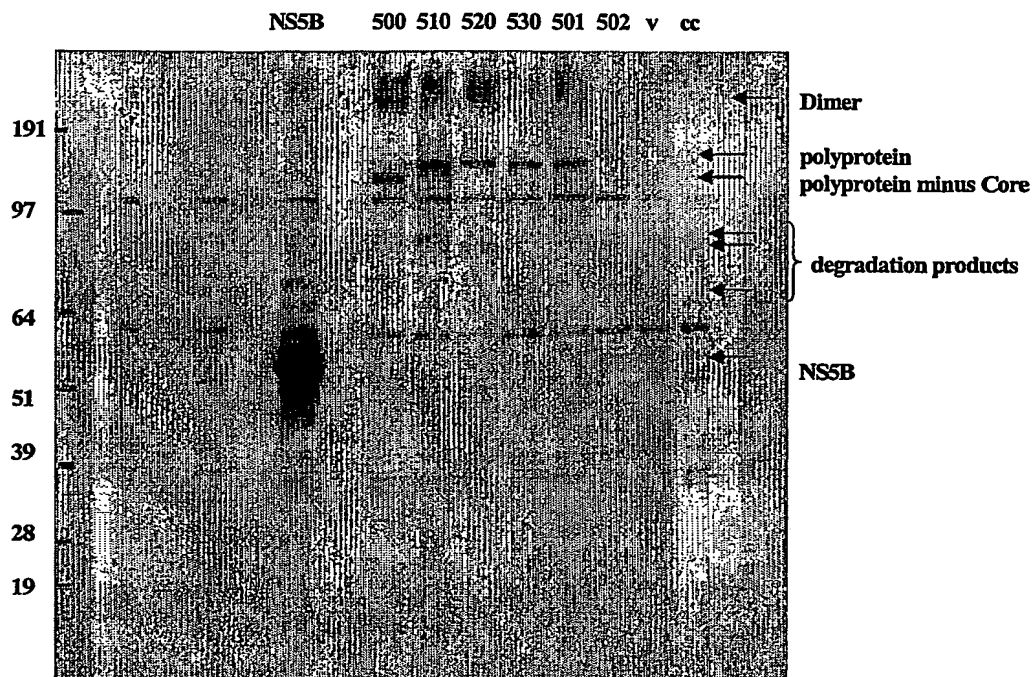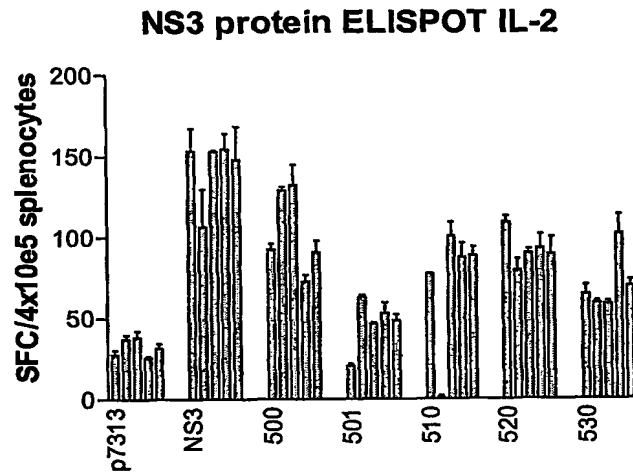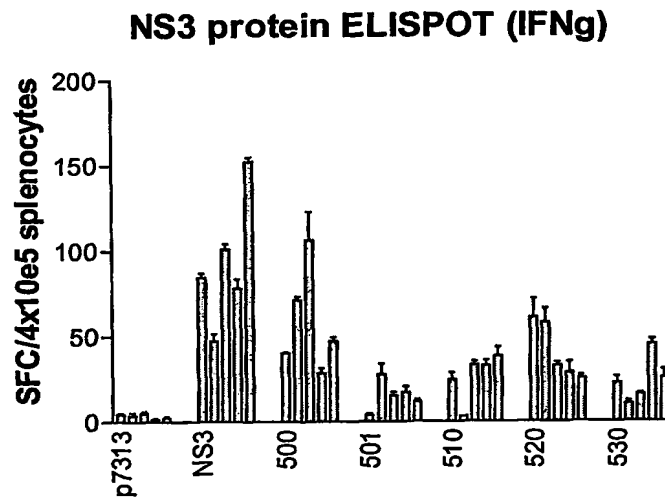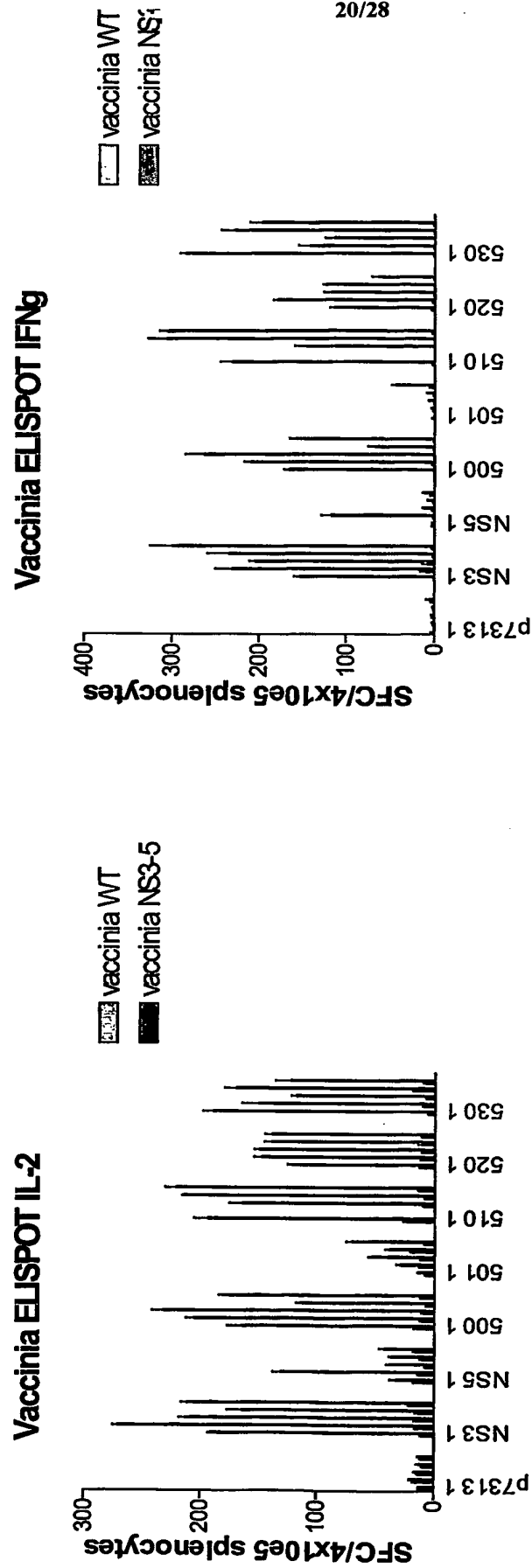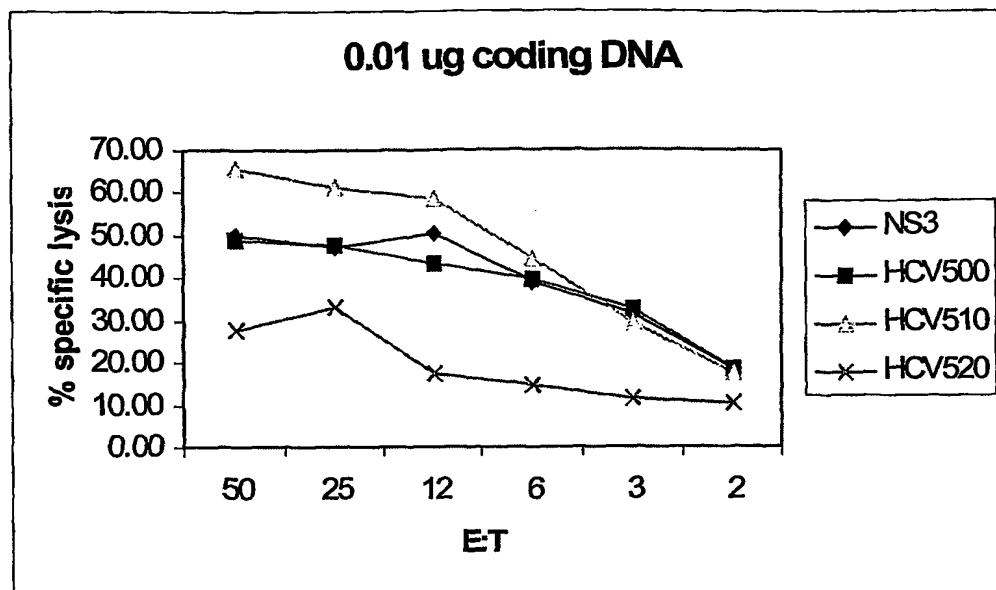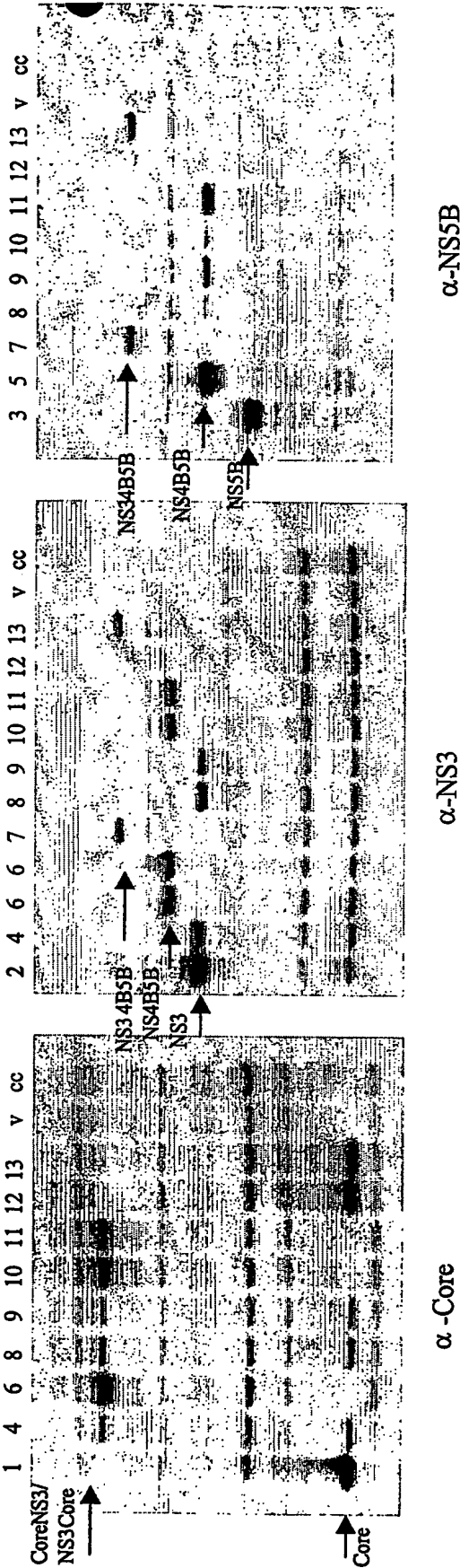
FIG. 17, Comparison of NS3 T cell response induced by dual promoter constructs.

KB03.HCV07 post primary IL-2 ELISpot
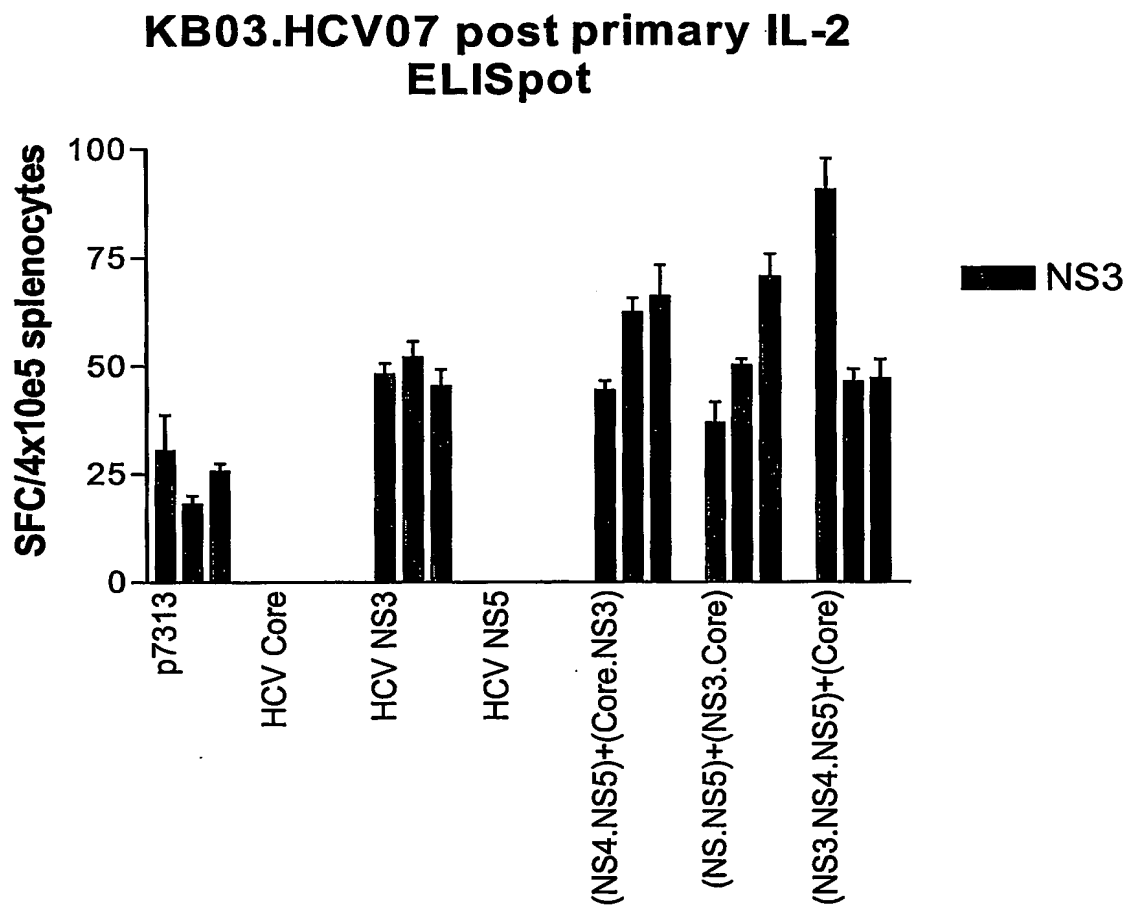
FIG. 18,
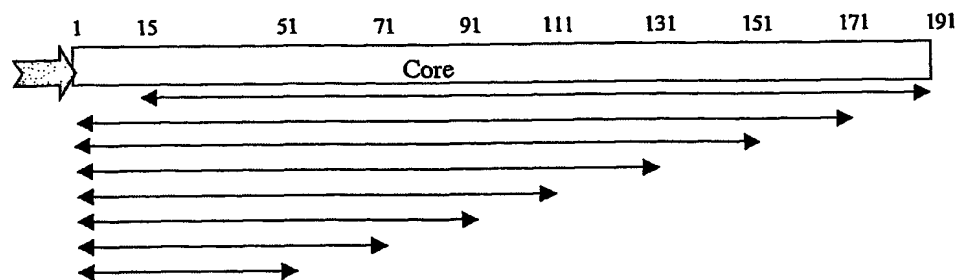
FIG. 19.
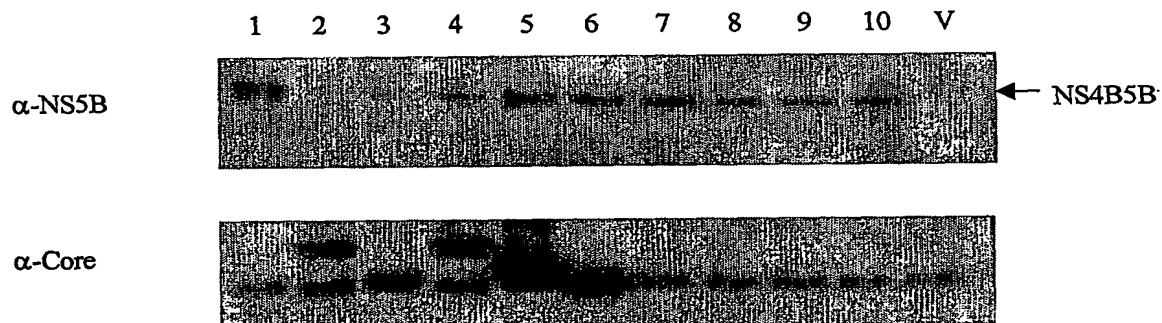
FIG. 20,

Effect of Core and Core₁₅₁ upon expression of NS3, NS5B, NS4B5B, and NS34B5B after co-transfection in 293T cells
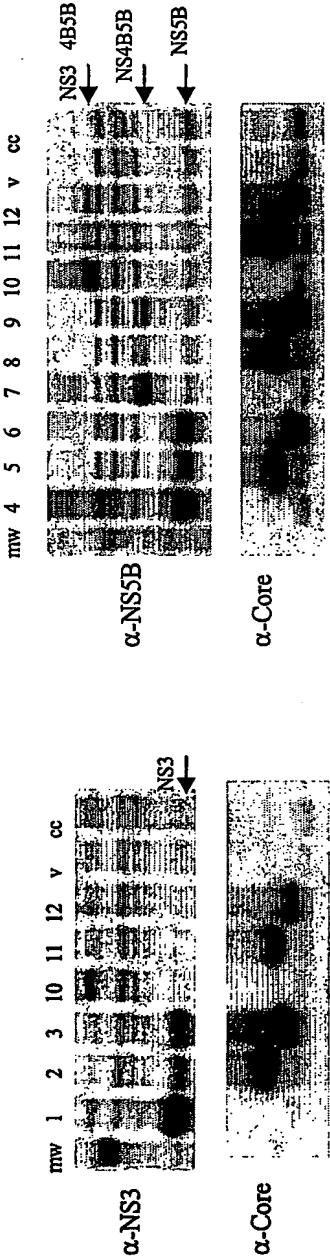
Samples:
1. p7/NS3 + v
2. p7/NS3 + p7/Core
3. p7/NS3 + p7/Core151
4. p7/NS5B + v
5. p7/NS5B + p7/Core
6. p7/NS5B + p7/Core151

7. p7/NS4B5B + v
8. p7/NS4B5B + p7/Core
9. p7/NS4B5B + p7/Core151
10. p7/NS34B5B + v
11. p7/NS34B5B + p7/Core
12. p7/NS34B5B + p7/Core151

FIG. 21,

Effect on expression of fusion proteins, after substitution of Core$_1$ for Core$_{191}$, in transient transfection in 293T cells
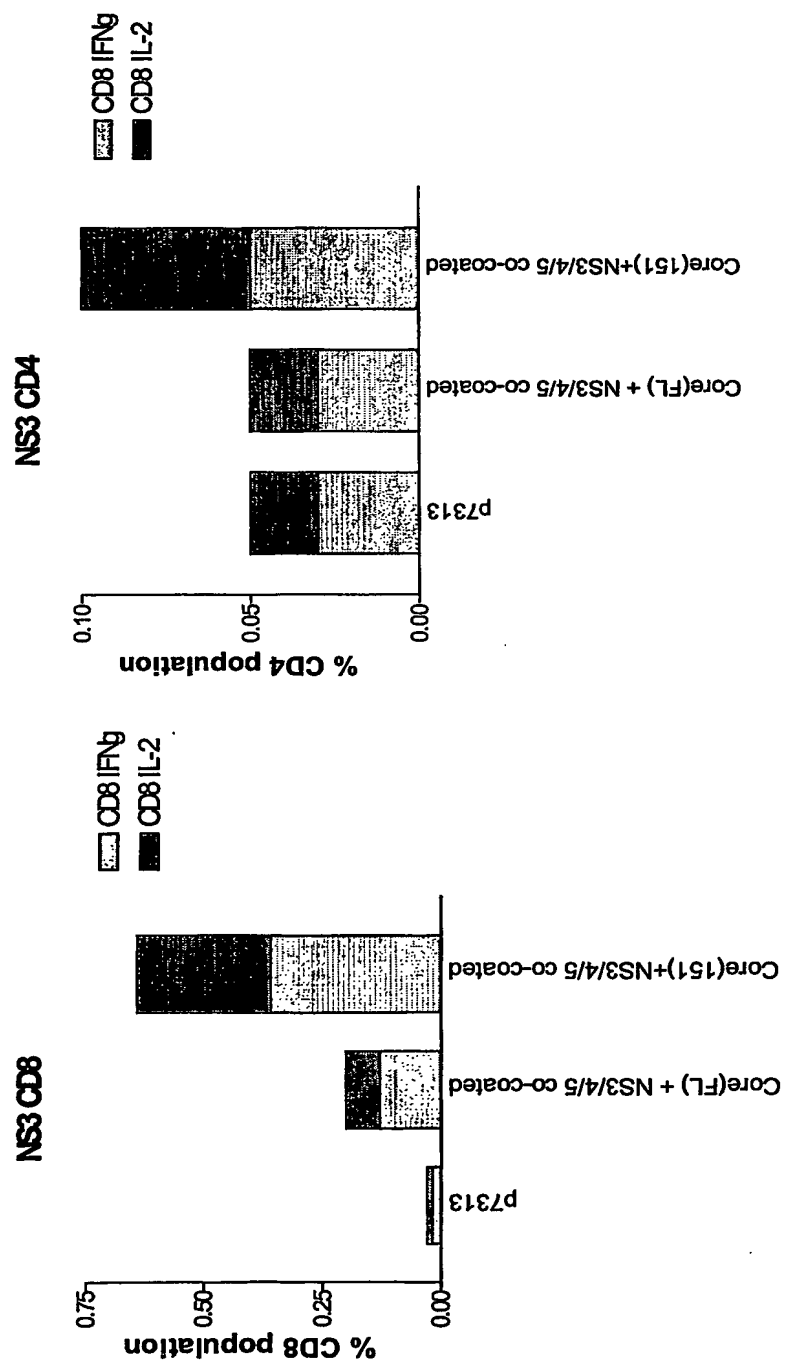

Gel A

α-NS3

NS3Core/
NS3Core151

NS3 4B5BCorex

α-Core

NS4B5BCorex
NS5BCorex

Gel B

α-NS5B

NS4B5BCorex

NS5BCorex

NS5B

NS3 4B5BCorex

Gel C

α-Core

NS3Core/
NS3Core151

Samples:
1. p7/Core
3. p7/NS5B
4. p7/NS3Core
5. p7/NS3Core151
6. p7/NS5BCore
7. p7/NS5BCore151
8. p7/NS4B5BCore
9. p7/NS4B5BCore151
10. HCV510 (p7/NS34B5BCore)
11. HCV510c151 (p7/NS34B5BCore151)

FIG. 22,

FIG. 23,